

What is claimed is:

- 1 1. A method of communicating in a mobile communications system,
2 comprising:
3 detecting that a first mobile station has stopped transmitting traffic
4 containing real-time, interactive data on a first channel portion; and
5 multiplexing traffic from a second mobile station on the first channel
6 portion during a period in which the first mobile station is not transmitting traffic.

- 1 2. The method of claim 1, further comprising receiving an indication that the
2 first mobile station is starting to transmit traffic.

- 1 3. The method of claim 2, further comprising allocating the first channel
2 portion back to the first mobile station.

- 1 4. The method of claim 1, wherein detecting that the first mobile station has
2 stopped transmitting traffic comprises detecting that the first mobile station has entered a
3 discontinuous transmission mode.

- 1 5. The method of claim 4, wherein detecting that the first mobile station has
2 entered discontinuous transmission mode comprises receiving a predetermined message
3 indicating that the mobile station is entering the discontinuous transmission mode.

- 1 6. The method of claim 1, wherein multiplexing the second mobile station
2 traffic comprises receiving the second mobile station traffic on a predetermined time slot
3 of a frame, the channel portion comprising the predetermined time slot.

- 1 7. The method of claim 1, further comprising receiving a request from the
2 first mobile station for the channel portion, the request indicating that the first mobile
3 station is about to start transmitting traffic.

1 8. The method of claim 7, wherein receiving the request comprises receiving
2 a request that is one burst in length.

1 9. The method of claim 8, wherein receiving the request comprises receiving
2 a request that coincides with traffic from the second mobile station.

1 10. The method of claim 9, further comprising extracting the request from a
2 combined signal including the request and the traffic from the second mobile station.

1 11. The method of claim 8, wherein receiving the request comprises receiving
2 a request that is based on an identifier associated with the mobile station.

1 12. The method of claim 11, wherein the identifier comprises a temporary
2 flow identifier.

1 13. The method of claim 11, wherein receiving the request comprises
2 receiving a request that contains a coded version of the identifier, the coded version
3 having a length that is longer than the identifier.

1 14. The method of claim 7, wherein receiving the request comprises receiving
2 the request during a period in which the second mobile station is transmitting traffic in
3 the first channel portion.

1 15. The method of claim 7, further comprising sending an assignment
2 message to the first mobile station.

1 16. The method of claim 15, wherein sending the assignment message
2 comprises sending a one-burst assignment message.

1 17. The method of claim 15, wherein sending the assignment message
2 comprises sending a plural-burst assignment message.

1 18. The method of claim 1, wherein detecting that the first mobile station has
2 stopped transmitting traffic comprises receiving a General Packet Radio Service
3 SID_FIRST indication.

1 19. The method of claim 18, further comprising receiving a Real-Time Fast
2 Associated Control Channel resource request message from the first mobile station for re-
3 assignment of the channel portion.

1 20. The method of claim 19, further comprising sending a Real-Time Fast
2 Associated Control Channel assignment message to the first mobile station to assign the
3 channel portion back to the first mobile station.

1 21. A system for use in a mobile communications system, comprising:
2 a wireless interface adapted to communicate over a wireless channel
3 portion with a first mobile station; and
4 a controller adapted to detect if the first mobile station has entered into a
5 discontinuous transmission mode and to allocate the wireless channel to another mobile
6 station when the first mobile station is in the discontinuous transmission mode.

1 22. The system of claim 21, wherein the wireless channel portion includes a
2 time slot of a frame having plural time slots.

1 23. The system of claim 21, further comprising a multiplexer to receive traffic
2 from the first mobile station when the first mobile station is in an active mode and to
3 receive traffic from the other mobile station when the first mobile station is in the
4 discontinuous transmission mode.

1 24. The system of claim 21, wherein the controller is adapted to detect a
2 request from the first mobile station for re-allocation of the channel portion back to the
3 first mobile station.

1 25. The system of claim 24, wherein the request comprises a request carried in
2 a General Packet Radio Service Real-Time Fast Associated Control Channel.

1 26. The system of claim 25, wherein the request comprises a Real-Time Fast
2 Associated Control Channel resource request message.

1 27. The system of claim 24, wherein the controller is adapted to further send
2 an assignment message to the first mobile station in response to the request.

1 28. The system of claim 24, wherein the request has a length of one time slot
2 of a frame.

1 29. The system of claim 28, wherein the request is based on an identifier
2 associated with the first mobile station.

1 30. The system of claim 29, wherein the request is a coded version of the
2 identifier associated with the first mobile station.

1 31. The system of claim 24, wherein the request coincides with traffic from
2 the other mobile station, the system further comprising a joint detector to extract the
3 request from a combined message including the request and the traffic from the other
4 mobile station.

1 32. The system of claim 24, wherein the controller is adapted to receive the
2 request during at the same time the controller is receiving traffic from the other mobile
3 station.

1 ~~33.~~ A mobile station comprising:
2 a detector to detect when the mobile station is entering discontinuous
3 transmission mode;
4 a controller adapted to send an indication to a base station of the
5 discontinuous transmission mode to indicate that a channel portion assigned to the mobile
6 station is idle,
7 the controller adapted to further send a request for re-assignment of the
8 channel portion when the mobile station exits discontinuous mode.

1 34. The mobile station of claim 33, wherein the controller is adapted to send
2 the indication according to a General Packet Radio Service protocol.

1 35. The mobile station of claim 34, wherein the mobile station is associated
2 with temporary flow identifier, the request being based on the temporary flow identifier.

1 36. The mobile station of claim 35, further comprising a storage unit to store
2 the temporary flow identifier, the mobile station keeping the temporary flow identifier
3 during discontinuous transmission mode.

1 37. The mobile station of claim 33, wherein the controller is adapted to further
2 receive an assignment message responsive to the request and to transmit traffic on the
3 channel portion after receiving the assignment message.

1 38. The mobile station of claim 33, wherein the channel portion comprises a
2 time slot of a frame.

1 ~~39.~~ A system for use in a mobile communications system, comprising:
2 a wireless interface adapted to communicate over a wireless channel
3 portion with one of a first mobile station and a second mobile station; and
4 a controller adapted to allocate the channel portion to the second mobile
5 station when the first mobile station is silent and to receive a request from the first mobile

6 station for allocation of the channel portion while concurrently receiving traffic from the
7 second mobile station.

1 40. The system of claim 39, wherein the channel portion comprises a time slot
2 of a frame having plural time slots.

1 41. The system of claim 39, wherein the request comprises a General Packet
2 Radio Service Real-Time Fast Associated Control Channel message.

1 ~~44.~~ An article comprising at least one storage medium containing instructions
2 for communicating in a mobile communications network, the instructions when executed
3 causing a system to:

4 detect a first mobile station entering discontinuous transmission mode, the
5 first mobile station assigned a channel portion to communicate traffic; and

6 multiplex traffic from a second mobile station onto the channel portion
7 during a time period in which the first mobile station is in discontinuous transmission
8 mode.

1 45. The article of claim 44, wherein the instructions when executed cause the
2 system to further receive a request from the first mobile station for a re-allocation of the
3 channel portion.

1 46. The article of claim 45, wherein the channel portion comprises a time slot
2 of a frame having plural time slots.

1 47. The article of claim 45, wherein the instructions when executed cause the
2 system to receive the request from the first mobile station that overlaps traffic from the
3 second mobile station.

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